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Auld

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(54) **ROTARY POWERED SURGICAL INSTRUMENTS WITH MULTIPLE DEGREES OF FREEDOM**

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See application file for complete search history.

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(57)

ABSTRACT

A surgical instrument may comprise a drive system that is configured to electrically generate a plurality of discrete rotary control motions. In at least one form, the surgical instrument may include an elongate shaft assembly that is operably coupleable to the drive system for receiving a first rotary control motion therefrom for rotating the elongate shaft assembly about a shaft axis. The elongate shaft assembly may be further configured to receive and transmit a second rotary control motion from the drive system to a surgical end effector that is operably coupled to the elongate shaft assembly to cause the surgical end effector to rotate about the shaft axis relative to the elongate shaft assembly. The elongate shaft assembly may be further configured to receive and transmit a third rotary control motion from the drive system to an articulation joint that communicates with the elongate shaft assembly and the surgical end effector to articulate the surgical end effector about an articulation axis that is substantially transverse to the shaft axis.

22 Claims, 99 Drawing Sheets

